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.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where a meaningful distinction exists between true zero and the value rounded
p	preliminary
r	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
E	use with caution
F	too unreliable to be published

Consumption patterns among aging Canadians

Amélie Lafrance and Sébastien LaRochelle-Côté

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The financial well-being of Canadian seniors has been the subject of many recent studies. In particular, the adequacy of retirement savings has been widely discussed, notably by Mintz (2009) and through a series of reports on the Canadian income security system. Many of these studies focus on the replacement rate—the extent to which income is replaced during the retirement years—and find that current cohorts of Canadian retirees typically achieve replacement rates in excess of 70% (LaRochelle-Côté et al. 2010, and Ostrovsky and Schellenberg 2009). Moreover, the replacement rate is even higher when the benefits of owned housing are taken into consideration (Brown et al. 2010).

Income, on the other hand, is of interest mainly because it enables consumption. Consumption is thus an alternative, and, in some sense, a more direct measure of seniors' well-being. Some studies that have examined differences across age groups on a cross-sectional basis have shown that older households consumed significantly less than younger households (Chawla 2005). However, little is known about the evolution of consumption among Canadians as they age.

The study of consumption over the life cycle is complicated by the fact that expenditure and consumption information is typically collected on a cross-sectional basis. One way around this challenge is to use a synthetic cohort approach, whereby a number of key social and economic characteristics known for varying across cohorts can be taken into account (LaRochelle-Côté et al. 2010). This approach is based on the assumption that people, say, 70 years of age in a survey collected in 2010, are deemed representative of those age 40 in a similarly designed survey in 1980. This study uses a synthetic cohort approach to generate information about the consumption patterns of a cohort of aging Canadians (see *Data source and selection of a synthetic cohort*). This paper also discusses consumption changes in relation to changes in household income, and examines whether consumption became more or less unequal as the cohort aged.

Expenditures and consumption

Expenditures and consumption are two separate concepts. In the Survey of Family Expenditures (FAMEX) and the Survey of Household Spending (SHS), total household expenditures are the sum of four separate components:

- **gifts,** which can be broadly defined as money transfers to charities and individuals outside of the household (e.g., children studying elsewhere, seniors' parents living in a nursing home, family members outside the country)
- **personal security,** including public and private pension plans, employment insurance, annuities, insurance payments, and similar items (excluding registered retirement savings plan [RRSP] contributions and contributions to other registered savings plans)
- **taxes,** including consumption and property taxes paid
- **consumption** itself, which can be defined as goods and services that can be bought or sold on the market for use by one or several members of the household.

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The last category—consumption—represents the largest portion of expenditures for the most Canadian households. Items in this category include expenditures on durables (e.g., house, furniture and automobiles) and non-durables (e.g., food, clothing and recreation).

Reporting on durable goods can vary since some people pay lump sums while others make regular payments. For residences and automobiles, in particular, the amount actually paid might not be representative of the usage (utility, in economic terms) of the item over the course of the period. One solution is to derive a consumption flow for these items that is more closely associated with their ongoing usage (Pendakur 1998). In this paper, consumption expenditures are imputed for two categories of durables: housing expenditures for homeowners and vehicles (see *Imputing consumption flows for housing and automobile expenditures*).

The size of the household also matters since consumption rises with the number of people. However, many household facilities—kitchens and living areas, for example—are shared by all members of the household. Thus consumption does not rise by the same amount for each additional person. In order to account for these economies of scale, a standard practice in the literature is to divide overall consumption by the square root of household size[5] (Pendakur 1998 and Lise 2001). As an illustration, this method assumes that a family of four consumes twice as much as someone living alone, while a couple consumes 1.4 times as much. This technique is especially relevant to the study of aging households because children are typically leaving the nest as their parents are approaching retirement.[6]

All consumption and expenditure figures are expressed in 2002 constant dollars.

Expenditures

In the early 1980s, this cohort of households spent an average of $36,600 annually (on a per-adult basis) when it was in its late 40s. Nearly 3 out of every 4 dollars were spent on consumption ($26,700). Taxes were the second-largest expenditure item, accounting for nearly 20% of expenditures ($7,100). Expenditures on personal

Data source and selection of a synthetic cohort

The main source of consumption information is the Survey of Household Spending (SHS). The SHS has been conducted on an annual basis since 1997, collecting detailed information on the income and expenditures of 10,000 to 20,000 households, depending on the year. Before 1997, consumption information came from another survey: the Survey of Family Expenditures (FAMEX). Although FAMEX and the SHS differ in some respects, similarly defined consumption and expenditure categories can be obtained at the aggregated level with both surveys.[1] Because FAMEX and the SHS cover nearly four decades of expenditure information among Canadian households, it was possible to derive a synthetic cohort of aging households categorized on the basis of the reference person's age.[2]

One problem often encountered with synthetic cohorts is the small sample size of surveys for a given age group. To increase the sample size, age groups covering several years were selected instead of just those born in the same year. In addition, survey years were combined to further boost the sample size. Hence, FAMEX observations collected in 1982 and 1984 were combined, as well as those collected in 1990 and 1992. Similarly, SHS observations were combined for 1997 and 1998, 2002 and 2003, and 2007 and 2008.[3] The resulting samples range from of 750 to 1,600 observations for five points in the life cycle: the late 40s, mid-50s, early 60s, late 60s, and early 70s. Table 1 describes the sample characteristics.[4]

Table 1 Sample characteristics

	Survey	Age	Sample size	Total sample
Early 70s	SHS 2008	71 to 74	481	1,089
	SHS 2007	70 to 73	608	
Late 60s	SHS 2003	66 to 69	751	1,416
	SHS 2002	65 to 68	665	
Early 60s	SHS 1998	61 to 64	760	1,605
	SHS 1997	60 to 63	845	
Mid-50s	FAMEX 1990	53 to 56	235	750
	FAMEX 1992	55 to 58	515	
Late 40s	FAMEX 1982	45 to 48	634	919
	FAMEX 1984	47 to 50	285	

Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

Imputing consumption flows for housing and automobile expenditures

Housing

One commonly used approach is to compute 'imputed rents' for homeowners.[14] This can be done by estimating a semi-log equation with measures of location and quality for the dwelling (for instance, number of rooms) as independent variables, very much in the spirit of Brown and Lafrance (2010):

$$\ln(rent)_{it} = \alpha + \beta rooms_{it} + \delta bathrooms_{it} + \gamma type_{it} + p_{it} + \varepsilon_{it}$$

where *rent* is the value of annual serviced rental payments incurred by the renter, which includes utilities (e.g., water, electricity and fuel). The right-hand side variables measure the quality of the dwelling (i.e., the number of *rooms*—including a quadratic term—and *bathrooms* in the dwelling and the *type* of dwelling), while *p* takes the province in which the dwelling is located into account. The predicted values from each model are used to calculate imputed rents for owner-occupied housing. These values include utilities (e.g., water, fuel and electricity) that would normally be associated with renters, which may not necessarily accord with the utility expenditures of homeowners. The share of utilities as a proportion of rent is calculated for tenants by dwelling type, as expenditures on utilities vary by dwelling type. These shares are then applied to the predicted rents for owner-occupied housing to determine the proportion of imputed rents that is accounted for by expenditures on utilities. The difference between these expenditures and actual expenditures on utilities is subtracted from the predicted rental values to obtain total shelter costs for homeowners.

Vehicles

This paper uses the method suggested in Pendakur (1998) to derive an imputed consumption flow for purchased transportation vehicles. The first step is to estimate a probit model among families with car operation expenses in excess of $100. In this model, the probability of purchasing a car is modelled as a function of variables indicative of a household's financial capacity: family size, net income, net income squared, and province. The predicted probabilities are then multiplied by predicted purchase prices obtained from another model of car purchases.[15] The total consumption flow from transportation is then equal to this imputed car purchase consumption flow, plus automobile operation expenses (e.g., gas, batteries and tires) and public transportation expenses.

security ($1,700) and gifts ($1,100) together represented about 8% of overall expenditures (Table 2).

Total expenditures increased to $40,000 as the cohort reached its mid-50s. This is not a surprise, since many people are in their peak earning years at this point in the life cycle. As the cohort aged further, expenditures eventually fell by almost $10,000, with most of the decline happening between the mid-50s and early 60s.

The decline in overall expenditures was primarily due to a drop in taxes paid. For individuals between their late 40s and early 70s, taxes paid declined by more than $3,000, thereby representing 58% of the overall decline in expenditures. Lower taxes are consistent with declining incomes during the retirement period (LaRochelle-Côté et al. 2008 and 2010).

Table 2 Average expenditures[1] among a cohort of aging households

	Late 40s	Mid-50s	Early 60s	Late 60s	Early 70s
			$		
Total expenditure	**36,600**	**40,000***	**33,600**	**32,400***	**31,100***
Consumption	26,700	27,300	24,800*	24,900*	25,300
Personal security	1,700	2,200*	1,300*	800*	700*
Gifts	1,100	1,600*	1,000	1,800	1,300
Taxes	7,100	8,800*	6,600	5,100*	3,900*
			%		
Total expenditure	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Consumption	72.9	68.3	73.7	76.6	81.4
Personal security	4.8	5.6	3.8	2.4	2.1
Gifts	2.9	4.0	2.9	5.4	4.0
Taxes	19.4	22.1	19.6	15.6	12.4

* Statistically different from the late-40s group at the 5% level of significance. When available, bootstrap weights were used for significance testing. Otherwise, a jackknife procedure was used.

1. Adjusted for family size. All dollar values were rounded to the nearest 100.

Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

In comparison, consumption fell by a smaller amount. Although it declined by about $2,000 between individuals' late 40s and early 60s, consumption recovered somewhat to reach $25,300 among households in their early 70s. This result is consistent with U.S. studies based on longitudinal data finding that retirement is associated with negligible decreases in consumption in most population groups (see, for example, Hurd and Rohwedder 2008).[7]

Although it was relatively small compared to overall consumption, spending on personal security declined from $1,700 to $700 over the period. This is expected since older households make fewer payments on pensions and employment insurance as they move into retirement. Finally, the amount dedicated to gifts remained more or less stable, amounting to just above $1,000 during most of the period.

Consumption

Consumption can be broken down into its components to determine how much households' spending on particular items changes over time. Four categories were used:

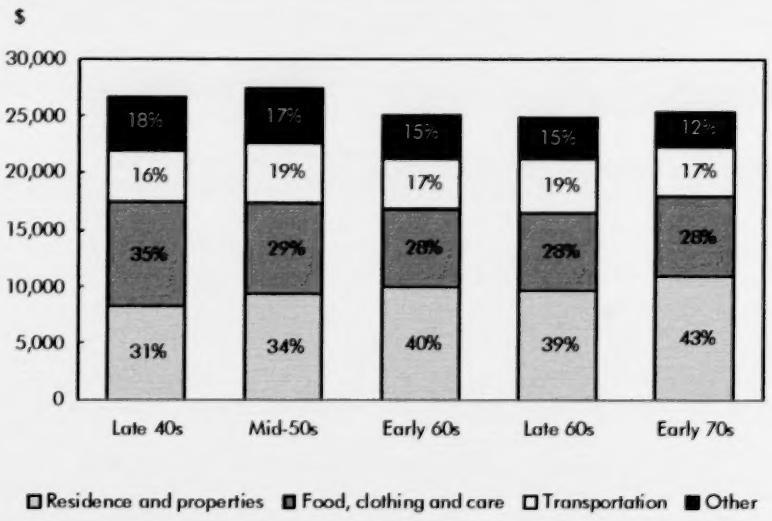
- **residences and properties:** including all expenditures related to home and property ownership, rental, maintenance, utilities, and household operations
- **transportation:** including vehicle expenses, car repairs and maintenance, and all spending on public transportation (public transit, train, plane, etc.)
- **food, clothing and care:** the sum of money spent on food (including restaurants), clothing, personal care, and health care (except public health care spending)
- **other items:** mainly comprising items that may be less essential for the health, safety or security of household members (spending on recreation, reading and printed material, tobacco and alcohol, and miscellaneous expenses are included in this category).

Although overall consumption did not change much over the period, the relative contribution of each category did (Chart A). When households were in their late 40s, expenses on food, clothing and care represented more than one-third of consumption. Spending on residences and properties amounted to just over 30%, while transportation and other consumption items accounted for 16% and 18%, respectively.

As households aged, they had a higher proportion of consumption expenses on residences and properties (43%) and a lower proportion on food, clothing and care (28%), and on other consumption items (12%).[8] Since many older homeowners stay in their homes as they age (Hou 2010), it is not surprising to see an increase in the relative size of housing expenses. Since housing expenses have been imputed for homeowners, they must be understood as a kind of dividend representative of the utility that homeowners derive from their homes rather than actual expenses.[9]

It is also possible to examine the sources of changing consumption patterns in more detail (Table 3). The increased spending on residences and properties mostly

Chart A Relative contribution of each consumption category[1]



1. Adjusted for family size.
Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

Table 3 Detailed consumption patterns[1]

	Late 40s	Early 70s	Difference
		$	
Residence and properties	**8,200**	**10,900***	**2,700**
Shelter	4,900	8,000*	3,100
Other accommodation	500	600	100
Household operations	1,400	1,500	100
Furnishings and equipment	1,400	800*	-600
Transportation	**4,400**	**4,400**	**0**
Purchased automobiles	1,500	1,700*	200
Automobile operations	2,400	2,300	-100
Public transportation	500	400	-100
Food, clothing and care	**9,300**	**7,000***	**-2,300**
Food	5,500	3,800*	-1,700
Clothing	2,400	1,100*	-1,300
Personal care	700	600*	-100
Health	700	1,500*	800
Others	**4,800**	**3,100***	**-1,700**
Recreation	1,800	1,500	-300
Reading and printed material	200	200	0
Tobacco and alcohol	1,300	600*	-700
Miscellaneous	1,500	800*	-700

* Statistically different from the late-40s group at the 5% level of significance. When available, bootstrap weights were used for significance testing. Otherwise, a jackknife procedure was used.

1. Adjusted for family size. All dollar values were rounded to the nearest 100.

Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

U.S. data, which showed that work-related expenses (particularly food and clothing) tend to decline during retirement years (Hurd and Rohwedder 2006, and Hurst 2007). That said, the decline in food and clothing spending took place as spending on health care increased.

Health

Households in their early 70s spent $800 more on health care on a per-adult basis than households in their late 40s. Although all categories of health care spending increased over the period (Table 4), about one-half of the increase was due to medicine and pharmaceuticals ($400) and one-quarter to health care supplies and services ($200). Health expenditures increased from 3% to 6% over the period as a proportion of overall consumption.

Consumption and income replacement

As noted earlier, a number of studies have examined the issue of income replacement rates among Canadian seniors. The general

came from an increase in spending on shelter—in fact, were it not for a significant decline in the money spent on furniture and equipment, the increase in the overall spending on residences and properties would have been even higher. Conversely, the decline observed among 'other' items was primarily due to significant reductions in the amount spent on tobacco and alcohol, and miscellaneous items.

Finally, spending on food, clothing and care declined primarily because of declines in food and clothing expenses. This is consistent with the findings of some studies based on

Table 4 Detailed consumption patterns[1]

	Late 40s	Early 70s	Difference
		$	
Total health spending	**700**	**1,500***	**800**
Medicine and pharmaceuticals	100	500*	400
Eye and dental care	300	400*	100
Health care supplies and services	100	300*	200
Insurance premiums	300	400*	100

* Statistically different from the late-40s group at the 5% level of significance. When available, bootstrap weights were used for significance testing. Otherwise, a jackknife procedure was used.

1. Adjusted for family size. All dollar values were rounded to the nearest 100.

Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

consensus is that the Canadian retirement system is achieving relatively high replacement rates. Studies focusing on more specific populations, such as those who were strongly attached to the labour market (LaRochelle-Côté et al. 2008 and Denton et al. 2009), those who did or did not contribute to a registered pension plan (Ostrovsky and Schellenberg 2009), and those who experienced a change in their marital status (LaRochelle-Côté et al. forthcoming) all reached similar conclusions. However, the evolution of income replacement rates has rarely, if ever, been studied in conjunction with consumption replacement rates.

In FAMEX and the SHS, household income is defined as the sum of wages and salaries, self-employment income, government transfers, and miscellaneous income (comprising income from retirement pensions, registered retirement savings plans [RRSPs] and retirement income funds [RIFs], and purchased annuities), minus taxes paid. Since housing investments also generate a source of implicit income for homeowners (Brown et al. 2010), the measure of household income used in this paper is adjusted to take this implicit income into account.[10] This measure of income is then used to calculate an index that can be compared to an index of consumption. As was done for expenditures, all income figures are expressed in 2002 constant dollars and have been adjusted to reflect changes in household size.

Within this cohort, the income of households rose by about 8% between their late 40s and mid-50s, and then declined to 84% of income earned in their late 40s by the time they were in their early 70s. Households in their early 70s therefore had income levels that were 16% lower than those of the cohort in their late 40s (Chart B). This profile is similar to those reported in studies of income replacement mentioned earlier.[11]

Since consumption levels remained relatively stable over the period, the cohort had consumption levels that were just 5% lower in their early 70s than in their late 40s (a decline that was not statistically different from zero).

The maintenance of consumption while income falls fits with a standard economic model. Life-cycle theory suggests that individuals choose a consumption path to maximize lifetime utility, determined by a lifetime budget constraint. According to this theory, individuals smooth their consumption patterns over the life cycle through borrowing and repayment, based on expectations about their income increasing during their prime working years and declining during their retirement years.[12] Since consumption follows a smoother trajectory than income, many individuals appear to be following this model of behaviour.

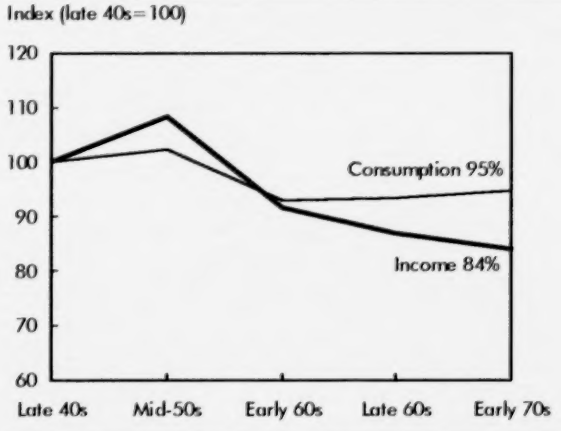
Consumption-to-income ratio

Consumption can be also expressed as a ratio of income. This ratio should not be interpreted as an indicator of financial stress, since housing expenditures are imputed for homeowners in our measure of consumption. Rather, it provides an indicator of the extent to which annual income—including income obtained from housing services—contributes to financing household consumption.

Income levels were sufficient to cover consumption expenses throughout the period (Table 5). However, the consumption-to-income ratio increased significantly over time. For every dollar of income, households in their late 40s spent 82 cents on consumption items, leaving 18 cents for other expenses and financial savings. Conversely, households in their early 70s spent 92 cents of every dollar of income on consumption.

Of households in their late 40s, almost one-quarter had consumption levels that exceeded their income level (22%). Among these, the median gap between their

Chart B Index of consumption and income patterns among senior Canadians[1]



1. Adjusted for family size.
Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

Table 5 After-tax income and consumption statistics[1]

	Late 40s	Mid-50s	Early 60s	Late 60s	Early 70s
Average consumption-to-income ratio	0.817	0.771	0.827	0.877	0.920
Households with income less than consumption (%)	22.3	27.3	37.4	44.8	44.1
Median income gap ($)	4,700	5,200	5,300	5,000	6,100

1. Adjusted for family size. All dollar values were rounded to the nearest 100.
Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

income level and their consumption was $4,700, indicating that income was not meeting overall consumption levels for a number of households, even among those in their late 40s.

The proportion of households for whom consumption exceeded income increased steadily over the period, from 22% among those in their late 40s to about 45% among those in their late 60s and early 70s. This suggests that many seniors rely on accumulated savings to finance their consumption, as life-cycle theory suggests. However, the typical income gap among those who consumed more than they earned remained relatively stable during most of the period, except between their late 60s and early 70s, when it increased from $5,000 to $6,100.

Consumption and income variation

Up to this point, this study has concentrated mainly on reporting averages. Looking at averages, however, says little about the dispersion of consumption and income around the typical household. Simply put, dispersion measures show the extent to which consumption (or income) became more or less unequal over the period. Income dispersion is known to decline among older individuals (LaRochelle-Côté et al. 2008), but little is known about the evolution of consumption dispersion. If, as economic theory suggests, consumption remains similar over the life cycle, then dispersion of consumption should also remain similar across the life cycle.

The dispersion of income and consumption can be measured in different ways. A widely used measure of dispersion, the P90/P10, is the ratio of the consumption (or income) of the household located at the 90th percentile divided by the consumption (or income) of the household located at the 10th percentile. A P90/P10 ratio of 3.0, for instance, would indicate that a household located at the 90th percentile consumes 3 times as much as a household located at the 10th percentile. A similar measure, the P75/P25, uses households located at the 75th and 25th percentiles. A third measure, the mean absolute deviation (MAD), is the typical deviation, in percentage terms, of a household's consumption from the average consumption level. For instance, if a MAD of 0.2 is found, this means that households typically deviated from the mean by 20%.

By almost any measure, the dispersion in consumption remained quite stable as households aged (Table 6). Taking the mean absolute deviation as an example, household consumption deviated from the household mean by between 28% and 32% throughout the period. Other measures yielded similar results. Households at the 75th percentile had consumption levels that were 1.6 times above that of households at the 25th percentile and that ratio remained relatively stable over

Table 6 Consumption and income dispersion measures[1]

	Consumption	Income
P90/P10		
Late 40s	2.7	3.4
Mid-50s	2.7	4.2
Early 60s	2.9	4.9
Late 60s	2.6	3.5
Early 70s	2.4	3.2
P75/P25		
Late 40s	1.6	1.9
Mid-50s	1.7	2.1
Early 60s	1.7	2.1
Late 60s	1.6	2.0
Early 70s	1.6	1.9
Mean absolute deviation		
Late 40s	0.313	0.400
Mid-50s	0.318	0.442
Early 60s	0.321	0.484
Late 60s	0.281	0.385
Early 70s	0.290	0.380

1. Adjusted for family size.
Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

time. The P90/P10 declined from 2.7 to 2.4 between their late 40s and early 70s. By this measure, consumption became a bit more equal as the cohort aged.

In comparison, income dispersion varied much more over the period. Households in their late 40s typically diverged from the group mean by 40% (as opposed to a 31% deviation in consumption). Income dispersion increased to 48% among those in their early 60s before the stabilizing effect of pension income brought dispersion back to the high 30% range in their late 60s and early 70s. Although the P75/P25 measure varied less, the P90/P10 also increased among households until they were in their early 60s, and then it declined. Hence, not only did consumption vary less than income at any point of the life cycle, but consumption inequality fluctuated less over time than did income inequality.

Even if consumption variance did not change over the period, the sources of that variance might have changed—especially in view of the changing consumption patterns reported earlier. Using a simple decomposition technique, the variance in total consumption can be expressed as a weighted sum of the variance in every consumption item plus a series of covariance items.[13] The results can then be expressed as a share of the total variance to show the extent to which the overall variance was due to each consumption category.

When households were in their late 40s, 11% of the total consumption variance came from spending on residences and properties, 15% from spending on food, clothing and care, and 68% from covariance items (Table 7). Very little of the overall variance across households came from the other two major consumption categories (transportation and 'other' items).

However, the share of the variance attributed to differences in housing increased substantially over the period, while the variance due to differences in spending on food, clothing and care declined. When households were in their early 70s, nearly one-third of the total variance in consumption could be attributed to variations in residence and property expenses, while only 7% was due to variations in spending on food, clothing and care. The share due to covariance items also declined slightly, from 68% to 59%. This suggests that even if the total variance changed little over the period, the sources of that variance differed over time. It is also consistent with the fact that spending on housing occupied a larger portion of consumption among older households.

Summary

Previous research indicated that many retired Canadians had incomes in excess of 70% of their income in their working years after adjusting for changes in household size. However, little was known about the consumption trajectories of aging Canadians. Using a synthetic cohort approach, this paper examined the consumption patterns of a cohort that was in its late 40s at the beginning of the 1980s, until its early 70s in the late 2000s.

When controls were introduced for the declining size of aging households, consumption levels remained relatively stable as households aged. Indeed, households in their early 70s consumed 95% of the level measured for the same cohort in its late 40s.

Although consumption varied little over time, the composition of consumption did change. Among older households, a larger share of overall consumption was devoted to housing expenditures. Conversely, they spent less on food, clothing and personal care items. Spending on health care increased over the period but still represented a relatively small portion of consumption.

Differences across households in terms of consumption also changed little over the period. In contrast, income differences reached a peak when households

Table 7 Variance decomposition of consumption[1]

	Late 40s	Mid-50s	Early 60s	Late 60s	Early 70s
			%		
Total variance in consumption	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Residence and properties	10.9	13.5	23.9	25.9	32.1
Transportation	1.0	2.3	0.7	1.8	0.9
Food, clothing and care	15.4	12.0	6.1	9.8	6.8
Others	4.7	5.0	2.1	2.3	1.0
Covariance items	67.9	67.2	67.1	60.2	59.2

1. Adjusted for family size.
Sources: Statistics Canada, Survey of Family Expenditures (FAMEX), 1982 to 1992; Survey of Household Spending (SHS), 1997 to 2008.

were in their early 60s, and then declined substantially. However, even though the overall variance of consumption changed little over the period, the source of that variance did change. Households diverged in spending on residences and properties, while spending on food, clothing, and personal care items converged.

Perspectives

Notes

1. One significant difference between the two surveys is the treatment of housing expenses (Statistics Canada 2000). This study deals with it by imputing housing expenses for homeowners (as in Brown et al. 2010).
2. The use of synthetic cohorts raises the issue of attrition, as some individuals in their late 40s could die or leave the country by the time they reach their mid-70s. Conversely, some households in their early 70s might not be entirely representative of households taken out of the 1982 to 1984 FAMEX in their late 40s—for instance because of immigration. While the issue of attrition through death has been minimized by restricting the end of the study period to a sample of households in their early 70s, little can be done about representativeness issues since both surveys provide a limited (or inconsistent) number of sociodemographic variables.
3. The 1984 and 1990 surveys were only conducted in 15 major cities. To construct a nationally representative sample for all pairs of years, the weights for respondents in each survey were divided by two except for respondents living outside the 15 cities in 1982 and 1992.
4. Comparisons with a younger cohort of individuals yielded very similar results. More precisely, results obtained for the four first timelines described in Table 1 were checked against the following samples: households age 45 to 48 and 47 to 50 in the 1984 and 1986 FAMEX (late 40s); those age 51 to 54 and 53 to 56 in the 1990 and 1992 FAMEX (mid-50s); those age 60 to 63 and 61 to 64 in the 1999 and 2000 SHS (early 60s); and those age 65 to 68 and 66 to 69 in the 2004 and 2005 SHS (late 60s).
5. Alternative definitions of 'per adult' consumption were tested and did not significantly alter the results.
6. Within our sample of households, 62% in their late 40s had children whereas only 6% in their early 70s still had children living in their homes.
7. The same authors (Hurd and Rohwedder 2006) report that some of the decrease in consumption can be accounted for by the substitution of non-market for market activities—for example, home-cooked meals as opposed to dining out—particularly among lower income groups.
8. Although extended care and similar institutions are excluded from the sample of households, it is possible that services, like meals and medical care, may be included in the rent of some older seniors.
9. Actual housing expenses were calculated and followed essentially the same path as imputed expenses.
10. An implicit measure of income derived from housing services can be calculated by using estimates of the balance owing on a mortgage. Since this measure is not always available in consumption data, these estimates are determined by using percentages obtained by year and age group as reported in Brown and Lafrance (2010). According to that study, the implicit source of earnings coming from investments increased income by 13% on average among those age 60 to 69, and by an even larger amount among those at least 70.
11. When housing services are excluded from the definition of household income, the income replacement rate is almost exactly the same as the one reported for a similarly aged cohort of individuals (LaRochelle-Côté et al. 2010).
12. These theories have long been a part of economic literature and were first discussed by Modigliani and Brumberg (1954) and Friedman (1957).
13. More formally, if all four major consumption items are represented by the terms X_1 to X_4, the variance of total consumption can be expressed as follows: $Var(Z)=C_1^2Var(X_1)+C_2^2Var(X_2)+C_3^2Var(X_3)+C_3^2Var(X_3)+C_4^2Var(X_4)$+ covariance terms where the terms c_1 to c_4 represent the shares of each consumption item in total consumption.
14. It was not necessary to impute a housing value for renters as annual rental expenditures declared by renters in survey data are considered to be annual housing consumption.
15. Independent variables used for the ordinary least squares (OLS) regression were the same as those used for the probit model. Other family characteristics, like immigration, could also have an impact on predicted probabilities but FAMEX and the SHS do not consistently report this information in all years.

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